BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a assembly in accordance with the present invention showing the transfer mechanism of the device in a lowered position.

FIG. **2** is a perspective view of a disc changer assembly in accordance with the present invention showing the transport mechanism of the device in a raised position.

FIG. **3** is a perspective view, partially broken of the disc changer of FIG. **2** showing the transport mechanism at the disc player.

FIG. **4** is a perspective view, partially broken of a disc changer in accordance with the present invention, showing the transport mechanism at the disc player and the disc ready to play.

FIG. **5** is a perspective view of a disc holding magazine in accordance with the present invention.

FIG. **6** is a planar view of a disc holding magazine in accordance with the present invention in place in the device of the present invention.

FIG. **7** is an elevational view of a device in accordance with the present invention.

FIG. **8** is a planar view of a transfer arm in accordance with the present invention.

FIG. **9** is an elevational view of a transfer arm in accordance with the present invention.

FIG. **10** is a cross-sectional view, taken along the plane of line **10**—**10** of FIG. **9** of a transfer arm in accordance with the present invention.

FIG. **11** is a cross-sectional view, taken along the plane of line **11**—**11** of FIG. **9** of a transfer arm in accordance with the present invention.

FIG. **12** is a cross-sectional view, taken along the plane of line **12**—**12** of FIG. **6** of a disc holding magazine in accordance with the present invention.

FIG. **13** is a similar cross-sectional view as that of FIG. **11**.

FIG. **14** is a partial elevational view of a leg of a transfer arm in accordance with the present invention.

DETAILED DESCRIPTION OF THE ILLUSTRATIVE EMBODIMENTS

Referring to the figures, FIGS. **1**–**4** show various steps in taking an optical disc **14** from storage to play. These steps will be explained in detail below. Although the illustrative embodiments describe the use of a compact disc or CD, it is to be understood that any type of optically readable disc may be substituted therefor.

FIGS. **1**–**4** show a compact disc changer assembly **10** having a magazine **12** for holding a plurality of compact discs **14**. The changer assembly **10** has a transport system **16** comprising a transfer arm **18** having generally a horseshoe shape, with a left inward projection **18***a* and a right inward projection **18***b* on which CDs **14** are seated by gravity. In the illustrative embodiment transfer arm **18** is molded of plastic but it may be cast or otherwise formed of a number of materials including, for example, aluminum.

Projections **18***a* and **18***b* each define a groove **19** (FIGS. **9**–**11**) on which CD **14** is seated. Grooves **19** sweep out an arc of the same radius as CD **14** and are situated such that CD **14** rests on both grooves **19** when a CD **14** is being carried by transfer arm **18**. Grooves **19** are designed to seat CD **14** by gravity and therefore are cut slightly wider than the rim of a CD **14** at the top of groove **19** and taper down so that they are slightly thinner than the thickness of the rim of CD **14** at the bottom of the groove.

The standard minimum rim thickness for CD's is 1.1 mm, or 0.0433 inches. The preferred lateral size, i.e. cross-sectional thickness, for grooves **19**, as shown in FIG. **13** is 0.1 inches at the top of groove **19** (FIG. **13**, dimension b) and tapers down to 0.040 inches at the bottom of groove **19** (FIG. **13**, dimension c). The taper described takes place over a preferred depth of 0.062 inches (FIG. **13**, dimension a). It is to be understood that a range of sizes 0.08 to 0.12 inches at the top of groove **19** and 0.34 and 0.433 inches at the bottom of groove **19** can be defined without departing from the novel scope of the present invention. Clearly, a bottom groove thickness of greater than the CD **14** rim thickness will cause CD **14** to tip and fall from groove **19**. Magazine **12** defines similar groove thicknesses for magazine grooves **42** (FIG. **1**). The preferred longitudinal size, i.e. length, for grooves **12**, of transfer arm **18**, is in the range of 5° to 15° of the circumference of CD **14**, but preferably 10° of the circumference (FIG. **14**, angle β). The preferred longitudinal size, i.e. length, for grooves **42**, of magazine **12**, is in the range of 70° to 100° of the circumference of CD **14**, but preferably 87° of the circumference (FIG. **12**, angle α). In FIGS. **12** and **14**, "D" represents the center of CD **14**. It is to be understood that these dimensions can be changed to accommodate different types of optical discs without departing from the novel scope of the present invention.

Transfer arm **18** is attached to carriage **20** which provides forward and reverse movement of transfer arm **18** along the longitudinal axis of magazine **12** as well as up and down movement of transfer arm **18**. Changer assembly **10** has rods **11***a* and **11***b* for structural stability of changer assembly **10** and to allow for the steady movements of carriage **20** which rides on rods **11***a* and **11***b*. Carriage **20** also has rods **21***a* and **21***b* for structural stability and to allow for the steady up and down movements of transfer arm **18** which rides on rods **21***a* and **21***b*.

FIG. **1** shows transfer arm **18** in the down position at which the device may retrieve CD **14** or deposit CD **14**. Changer assembly **10** includes motor **22**, gear **24** and horizontal lead screw **26** keyed to gear **25** (FIG. **6**), which together, in combination with inner threaded gear or "power nut" **27** (FIG. **2**) on carriage **20**, allow carriage **20** to move forward or backward along the longitudinal axis of magazine **12**, on rods **11***a* and **11***b*. Carriage **20** also includes a motor **28**, gear **30** and vertical lead screw **32**, keyed to gear **31** (FIG. **1**), which together, in combination with inner threaded gear or "power nut" **29** on carriage **20**, allow transfer arm **18** to rise or descend along carriage **20**, on rods **21***a* and **21***b*. Carriage **20** further comprises a clamp **34** for holding CD **14** to CD player **36** and a motor **38** and gearbox **40** which together allow clamp **34** to open and close on CD **14**.

Magazine **12** comprises a tray **13**, preferably molded of plastic, having a plurality of grooves **42**, each having a V-shaped cross-section, defining an arc having the same sweep and radius as the arc of CD **14**. Magazine grooves **42** are of a size and shape similar to grooves **19** discussed above. Magazine grooves **42** are defined such that CD **14** rests within a magazine groove **42** held only by gravity and friction. Magazine **12** further comprises a rotatable handle **44**, having aligning pins **46** along legs **44***a* and **44***b*. Magazine **12** may be lifted and carried, without dropping CDs **14** carried therein, when handle **44** is in its upright position (FIG. **5** dashed lines, and FIG. **7**). Handle **44** helps to maintain magazine **12** in its proper position when magazine